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**Diversity in Economic Decision-making and Behaviour:
A New Brief Review***

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Abstract

Taking into account the relevant literature, it is argued in this review that important advances can be made in the application of decision sciences to economics if greater attention is given to the presence of diversity in the types of economic decision-making and behaviour. This is of particular significance for understanding market dynamics. This requires both rational and irrational types of decision-making to be taken into account. A limitation of neoclassical and much mainstream economic theory in its lack of consideration of this diversity and its economic consequences. Different types of rational and irrational choices are specified in this article. Even rational decision-making and behaviour can be quite diverse. Empirical evidence is provided of diversity in economic decision processes and the consequences of this diversity is noted. Most attention is paid to the influence on the dynamics and stability of market systems of the diversity of the beliefs and behaviour of market participants. It is shown how a preponderance of sticky decision-making or restrained reactions in markets can improve the dynamics of their adjustment when market equilibrium alters or a market is disturbed but its equilibrium remains unchanged. It is observed that these reactions can be socially beneficial. Several different restrained forms of decision-making and behaviour are identified which make for stickiness in market behaviour and decision-processes.

Keywords: Economic attentiveness, economic diversity, market dynamics, market stability, rationality, sticky decisions.

JEL: D9, E7.

1. Introduction

In this paper, it is argued that advances in the theory and application of decision science (and in its relevance to economics) will be facilitated if greater attention is paid than currently to the existence of different types of rational decisions and the diversity of behaviour. The diversity of behaviour should encompass not only variations in rational decision-making but also those which might be regarded as irrational.

A general scientific theory of behaviour should take into account all types of behaviour. This requires consideration to be given to the distribution of different types of decision-making and behaviour in populations, the persistence of these distributions and identification of the factors that cause these distributions to alter as well as the extent to which they change. Regular and relevant laws about market decision-making and its consequences can be established once this approach is adopted. Theories which assume uniformity in decision-making and behaviour become special cases, and scientific progress is promoted.

Neoclassical models of economic decision-making and behaviour represent special cases because (among other things) they do not allow for the presence of diversity in decision-making and in behaviour. Alfred Marshall (1920) based his theory of economic supply on decision-making by representative firms and John Hicks (1956, p. 55) assumed that, in order to develop his microeconomic theory, it was adequate to model it on the basis of the type of decisions an average consumer is supposed to make. Although both these economists were aware of the existence of diversity in economic decision-making and behaviour, they did not incorporate these aspects into their theories.

Today also, all microeconomic texts fail to pay much attention to diversity in economic behaviour. While this can be useful if only a general guide is needed about how most markets work, it is inadequate for understanding the operation of all markets. Furthermore, the type of rational decision-making which is the usual

basis of neoclassical economics is not necessarily rational nor representative of reality, as will be made clear in this article and has been noted by others.

The preoccupation persists of many economists with the supposed prevalence of rational economic behaviour and its uniformity, as well as its desirability. For example, there is a continuing preoccupation with rational expectation models. This is either because it is believed that they are a relevant description of economic reality (Muth, 1961) or because actions based on rational expectations represent desirable behaviour. Both empirical evidence and advances in decision theory (such as the development of theories of bounded rationality, see Simon, 1957; Tisdell, 1968, Ch. 2) cast doubt on the wisdom of assuming that economic agents display a high degree of rationality in their decision-making and in their behaviour (see also Tisdell, 1971). Moreover, the extent to which uniformity occurs in decision-making and behaviour is limited.

In order to elaborate on the above contentions, the following matters will be considered in turn:

- Why are most economists preoccupied with rational decision-making and behaviour?
- A classification of different types of decision-making and behaviour in relation to the concept of rationality will be proposed.
- Basic sources of diversity in economic decision-making and behaviour will be identified.
- Evidence will be presented about the occurrence and the diverse nature of decision-making and behaviour.
- Economic implications of diversity in types of decision-making and behaviour will be highlighted.

2. Why are Most Economists Preoccupied with Rational Decision-Making and Behaviour?

There are several possible reasons why most economists focus their analyses on

rational decision-making and behaviour.

These include the following:

- They believe that individuals (and economic agents) do act rationally, or the overwhelming majority do.
- They consider it to be important to discover ways to improve the rationality of economic decision-making and behaviour. The focus, in this case, is on discovering methods which result in decisions and behaviour being more rational.
- They may also be of the opinion that rational economic decision-making and behaviour is “desirable”.
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The first two reasons are positivist in nature whereas the last reason is a normative one.

Much of economic theory and its application is based on the view that individuals do act rationally (for example, neoclassical economic theory and theorems of rational economic expectations). In addition, many economists believe rational behaviour to be desirable. Economists have given far less attention to the methods for improving the rationality of decisions and behaviour but these have not been entirely neglected by them (Tisdell, 1996, Ch. 3).

Unfortunately, the meaning of the concept of rationality in decision-making and behaviour has not been given much attention by economists. Once the nature of rationality as a concept is considered, it becomes clear that the range of decisions and behaviour that can be classified as rational is very diverse. This diversity of behaviour and types of decision-making is even greater when the presence of irrational behaviour is accounted for. The scope for this diversity can be appreciated by considering the following classification of types of decision-making and behaviour in relation to the concept(s) of rationality.

3. Classification of Types of Decision-Making in Relation to the Concept(s) of Rationality and Implications for Diversity

Two different meanings in English of the word 'rational' exist. One implies the presence of (logical) reasoning. The other is a wider concept. It is associated with behaviour or decision-making that can be regarded as reasonable. It should be noted that some behaviour that involve logical reasoning may be unreasonable. Furthermore, some behaviour that involve no reasoning can be reasonable or rational, given the second meaning of rational. These possibilities are noted in Tisdell (1996, Ch. 2). The Venn diagrams help to clarify these concepts (Fig. 1).

The set D in Fig 1 includes instinctive behaviour which are reasonable (or effective for a specific purpose) if circumstances arise when there is no time for reasoning. The rational amount of reasoning depends on the urgency with which action is required. Possibly, some habitual behaviour could also be included in set D.

The status of another set of decision-making processes also needs consideration. These involve the rationality of predetermining actions to be taken should particular events occur in the future. The degree of preparedness for future decisions or actions may be rational or irrational, and the exact action to be taken in the event of a particular occurrence may be completely determined or may only partially be determined. Completely determined responses basically involve no reasoning, once a specified event occurs or is observed. Individuals are liable to differ in the extent to which they prepare in advance for making future decisions. Moreover, the extent to which it is rational for them to do so is also likely to vary.

A major issue in considering the rationality of decision-making and behaviour is how to take account of the adequacy of the perceptions of individuals of reality. Many decisions have to be made on the basis of limited knowledge of reality. Furthermore, given the cost of information gathering and its organization, it is usually only rational to attain a limited knowledge of reality. Because individuals often acquire different sets of information about reality, this is an added source of

diversity in their decisions and behaviour.

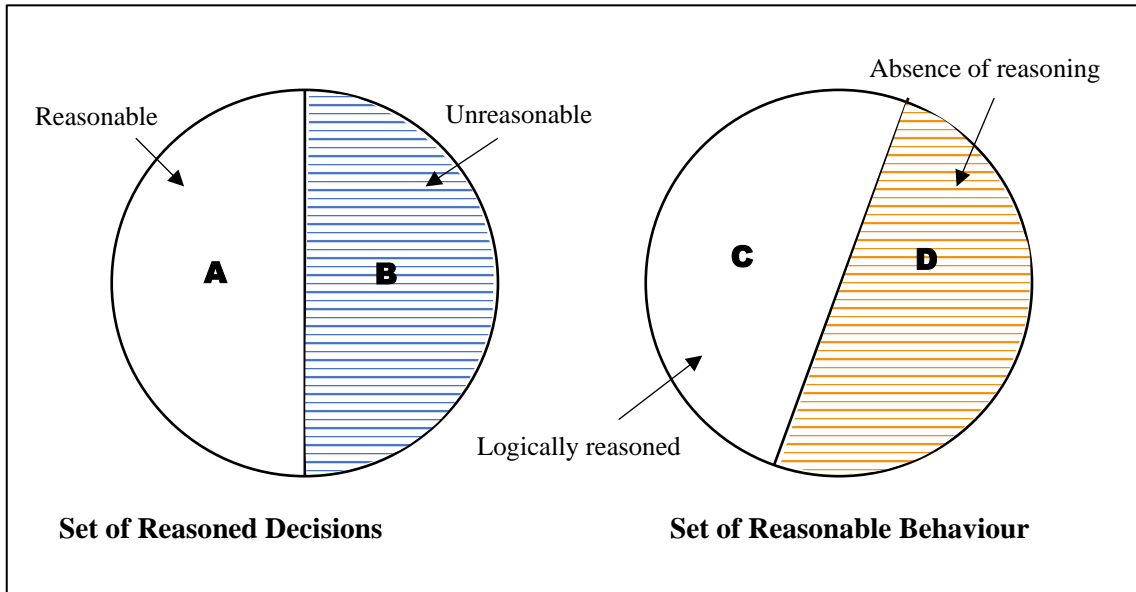


Figure 1

**A classification of rational decision-making and behaviour.
The size of the sets is not indicative of frequencies.**

Even given the same set of evidence, individuals can reasonably come to different conclusions about its implications. Usually, evidence about reality is incomplete. Consequently, the implications of evidence about reality are often uncertain. This can be an additional source of differences in behaviour.

To some extent, theories of decision-making based on subjective probability (De Finetti, 1937; Savage, 1954) and on logical probability (Carnap, 1950; Keynes, 1921) allow for this diversity. These probability distributions can be different for different individuals even if they are provided with the same evidence. For example, given the same set of evidence, it can be rational for two different individuals to come to dissimilar conclusions about its probable implication for reality. For instance, their probability distributions in relation to this evidence can differ. For example, in determining logical probabilities, individuals may place different weights on the reliability of the evidence presented to them or obtained.

The complexity of the real world conditions limits the application of some statistical models and experiments to the actual processes of decision-making. Statistical models based on relative frequencies can, for instance, be inapplicable. This is also true of structured experiments that basically rely on responses to the relative frequency of the occurrence of particular events or changes in their frequencies.

4. Evidence About Diversity in Decision-Making

Tisdell and Wilson (2012) found, as a result of surveying visitors to a tourist attraction in northern Queensland (Jourama Falls), that they varied considerably in how well they were informed before visiting such attractions, and the amount of time they spend on informing themselves differs a lot (Tisdell and Wilson, 2012, Ch. 7). Respondents also reported substantial differences about when they gathered information about tourist attractions in a holiday region. Nearly 31 per cent of respondents said that they gathered most of their information about tourist attractions in a holiday region before arriving in the region, just over 13 per cent reported that this was done once they arrived in a holiday region, and 52.5 per cent

responded that they collected about equal amounts of information before and after coming to a holiday area (Tisdell and Wilson, 2012, Ch. 7).

A very small proportion of respondents gave no answer or an incorrect reply to this query. These results indicate that considerable diversity can occur in the way in which tourists make decisions to visit tourist attractions. These differences are likely to be important for devising strategies to promote and advertise tourist attractions.

A survey of visitors to Mareeba Wetland and Savannah Reserve in northern Queensland revealed substantial diversity in their knowledge about this attraction prior to their visit and the considerable lack of their prior knowledge about it. Just over 77 per cent of those interviewed reported that their prior knowledge of it was non-existent or poor whereas nearly 33 per cent said that their prior knowledge of it was good to excellent (Tisdell and Wilson, 2012, Section 8.4). Nearly 86 per cent of visitors surveyed were first-time visitors, and they were the ones who were mostly poorly informed prior to their visit or who said they had no knowledge about the attraction before visiting it.

As a result of an experiment-based study, Henckel *et al.* (2018) produced strong evidence in favor of the hypothesis that there is considerable *heterogeneity* in the frequency with which beliefs are updated and in the amount by which beliefs are varied as the signals received by individuals are altered. Furthermore, they found that most participants in their experiment did not rationally adjust their beliefs (expectations) when rational adjustment is determined by the application of Bayes law. Only 5 per cent of their respondents acted in accordance with Bayes law.

Moreover, they discussed that when their subjects did change their expectations (beliefs), they did so by only 35 per cent of the amount required by Bayesian updating. They state that the amount of this adjustment falls “well short of what full rationality requires”. They are of the opinion that beliefs and decisions tend to be ‘sticky’. Stickiness can have two dimensions, namely infrequent adjustment of

beliefs as events alter, and damped (moderated) changes in beliefs.

The extent to which the experimental results and analysis of Henckel *et al.* (2018) can be generalized is unclear. However, both these dimensions of decision-making are important and worthy of further investigation. As discussed below, both diversity in behaviour and in their stickiness can be important for the stability of some types of markets.

5. Economic Implications of the Distribution of Different Types of Decision-Making and Behaviour and Restrained Reactions

Tisdell (1968, 2013) and others have identified several economic implications of variation in the distribution of different types of economic decisions and behaviour of economic agents, but more needs to be done. It was noted in the previous section that differences in the decision-making processes of tourists are important factors to take into account when advertising and promoting tourist attractions. To give another example, the distribution of the willingness of potential buyers to purchase new products affects the dynamics of their market penetration and the flow of profits from product innovations.

The nature of these flows can make the difference between innovative success and failure and is consequential for business viability (Tisdell, 2013, Ch. 3). Several other examples could be cited. In this section, I want to focus on how restrained reactions of market participants can promote stability and convergence to market equilibrium when market conditions change.

The degree of restraint displayed by market participants in adjusting to altered market conditions often differs; some are more restrained in their reactions than others. The dynamics of market adjustment depends upon the overall restraint exhibited by buyers and sellers in responding to altered market conditions. In several cases, market responses which are restrained can help a market to converge towards a new market equilibrium or facilitate its return to an existing one when a

temporary shock causes a deviation from equilibrium. The latter possibility is illustrated by Tisdell (2013, Sections 9.3 and 9.4) and the former case is considered below.

‘Stickiness’ in decision-making and economic behaviour can have a positive social economic value in such cases. This is because the loss in consumers’ plus producers’ surplus is less than it would have been had market decision-making been more volatile, and economic behaviour more reactive.

This hypothesis is readily illustrated by considering the simplest type of market cobweb model. In this model, sellers base their supply decisions on the assumption that the price they receive for their product in one period will prevail in the next. This type of behaviour can result in considerable market instability. Depending on the relative slopes of the supply and demand curves in these markets, it can generate cycles that converge towards market equilibrium, and those which do not. The latter cycles may be of an explosive nature (resulting in increasing divergence from market equilibrium) or such that regular cycling around the market equilibrium occurs without there being divergence or convergence to this equilibrium.

If there is less responsiveness to price changes (compared to the simple cobweb case) this reduces the amplitude of the market cycles. Suppose for example, that market disruption is caused by a sudden fall in demand for a product. Imagine that suppliers react to this lower price by predicting a somewhat higher price in the next period or that they act as if they do this. Suppose also that in subsequent periods when the market price has risen, they anticipate a somewhat lower price in the next period and then, when the market price has risen, they expect a lower price in the next or they act as if they do. Consequently, their market reactions are moderated compared to the simple cobweb case, and the amplitude of cycling around the new market equilibrium is reduced.

This is illustrated in Fig. 2. The market for the focal commodity is assumed to be initially in equilibrium at point E_1 . Now assume that the demand curve for the

commodity drops to DD, and that the supply curve shown by AS remains unaltered. The new market equilibrium is now E_2 . As a result of the sudden drop in demand, the price of the commodity falls from P_1 to P_0 . This gives rise, if the simple cobweb model applies, to the cobweb relationship which is more distant from E_2 than an easier one also shown.

The inner web results if the responses of suppliers to price changes are moderated (as a whole) compared to the situation in which the simple cobweb applies. The heavy dots identify (once market demand for the commodity suddenly contracts) the successive market values generated by the different types of decisions made by suppliers, that is if the simple cobweb relationship applies and if restrained market variations occur. Only a portion of the different cycles are illustrated.

It is evident from Fig. 2 that the amplitude of the market fluctuations is reduced if the market reactions of suppliers are restrained. Furthermore, the divergence between actual market values and equilibrium values is reduced if this type of restraint occurs. Consequently, the sum of consumers' surplus plus producers' surplus is greater than otherwise. In fact, both buyers and sellers benefit by an increase in their flow of surpluses as a result of the reduction in the amplitude of the market cycles.

The above analysis assumes that the extent of the restraint in decision-making and behaviour displayed by suppliers as a whole still results in market cycles being generated. It is however, conceivable that the market responses of suppliers may be so sticky, as a whole, that market cycling does not occur. The effect of this needs additional analysis.

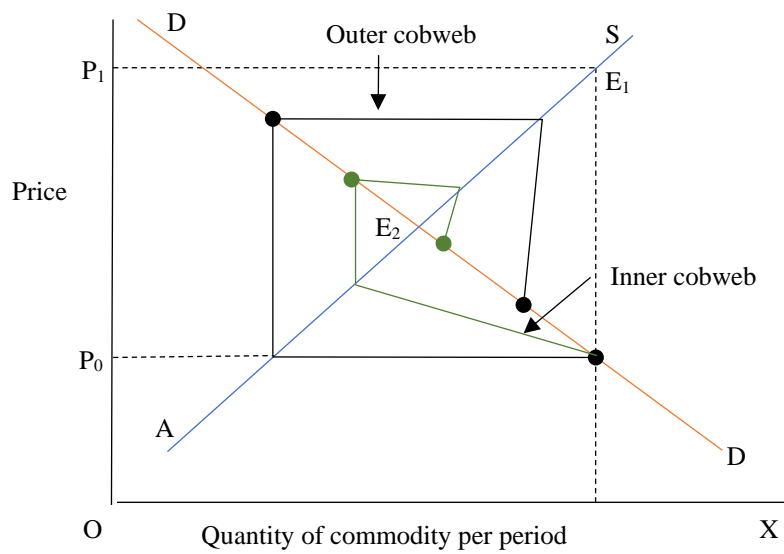


Figure 2

Illustration in which convergence to a new market equilibrium is facilitated if the overall reactions of suppliers is more restrained than in the simple cobweb case.

If their responses are very shaky, this can impede movement towards market equilibrium. If these responses are too sticky, the outcome can be less beneficial from a social point of view than when some cycling occurs. This happens if derivations from the market equilibrium are more prolonged and are larger than in the case of cycling alternatives. Both socially excessive and inadequate restraint in market decision-making are possible when the results of this type of modeling of decisions and behaviour are analyzed.

The above modeling assumes that beliefs are conservatively updated after each market period. However, in some markets, beliefs may only be intermittently updated and when adjustments do occur, they may do so by substantial amounts, resulting in over-reactions to changing market conditions (Henckel *et al.*, 2018; Menzies and Zizzo, 2009).

There are several reasons why stickiness in decision-making can occur apart from caution in adjusting beliefs. For example, satisficing behaviour by normal market participants can be present. In these cases, satisficers do not alter their market behaviour unless their level of satisfaction drops below some threshold, or unless the benefits forgone by not adjusting are quite large. Transaction costs can also play a role in reinforcing stickiness in decision-making.

Sitzia *et al.* (2015) found that in relation to the market for electricity and gas services, complexity in the number and bundling of alternative tariffs resulted in consumer inattention to market alterations and therefore, in sticky choices by consumers as well as sub-optimal outcomes for them. The first mentioned influence appears to be a reflection of the existence of bounded rationality (that is, the benefit of finding the best tariff exceeding the decision-making cost of doing so). Inattention is a somewhat vague notion. However, a low level of attention can also be a product of satisficing behaviour.

An important issue that needs more consideration is the extent of differences in these types of decisions by buyers and why they occur, as well as the way they are

associated with socioeconomic factors. For example, are on average low income individuals more conversant with the prices of staple food items than those on higher incomes and are they more likely to change the composition of their food purchases as these prices alter? If so why?

In some markets (such as stock markets), the balance between the numbers of those who make their decisions based on fundamental considerations and chartists can also be important in influencing the dynamics and stability of these markets (Lasselle *et al.*, 2005). One of the reasons why the prices of crypto currencies are so unstable is that they possess no long-term economic fundamentals to help anchor their prices. Furthermore, in other markets, the balance between those who decide on their market behaviour by pursuing satisficing aims and those who are motivated to maximize their anticipated profit influences the dynamics and stability of these markets (Lasselle *et al.*, 2001; Tisdell, 2013, Section 9.2).

The diversity in decision-making displayed by market participants has many different economic implications. The study of this subject is in its infancy and there is still much to be learnt. Nevertheless, progress is being made because it is now widely recognized that market decision-making and behaviour is more complex and varied than was assumed in neoclassical economic theory.

6. Concluding Comments

There is strong evidence of differences in types of decision-making made by individuals. Advances in economic thought and its applications will be facilitated if this is given greater recognition in the development of economic theory and empirical work. This hypothesis, however, is not inconsistent with some types of economic decision-making and behaviour being more common than other types. Nevertheless, the presence of this diversity is relevant both from pragmatic and theoretical points of view, as has been illustrated in this paper.

There are many reasons why the types of decision-making of individuals can be

disparate. It is often reasonable for economic agents, depending on their different circumstances, to adopt decision processes which are dissimilar but nevertheless rational, as has been explained above. In addition, irrational types of decision-making and behaviour can occur. There may be some regularities in the frequencies of these types of behaviour but even when this is not so, the differences are likely to have predictable consequences which are amenable to analysis.

Some empirical evidence was presented of the diversity in differences in the decision-making behaviour of individuals, for example, about disparities in the ways that tourists make their decisions to visit tourist attractions. Business implications of these examples were noted. Evidence from an experiment conducted by Henckel *et al.* (2018) also supported the existence of disparities in decision-making processes and the limited occurrence of rational beliefs when judged by their conformity with Bayes law.

Diversity in the types of market decisions made by market participants can be influential in affecting market dynamics. For example, as demonstrated, if the mixture of reactions of sellers to changes in market prices is more restrained than in the simple cobweb case, this can have socially favorable consequences for the nature of market dynamics. Up to a point, both buyers and sellers can gain by decisions which result in restrained market responses. Although restrained or stickiness in decision-making is not always socially (or individually) desirable, it is important to identify circumstances in which this is so and those for which it is not the case.

In addition, bearing in mind the prevalence of uncertainties, it is worthwhile undertaking further research to determine the circumstances under which cautious sticky types of decisions are rational, as well as those where this is not so. Consideration also needs to be given to how and why the mixture of different types of decision-making by market participants alters. This will benefit from experimental evidence and behavioural/psychological studies.

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